Question 1:

Write a Python program that acts as a code-breaking device, translating letters into their corresponding digits using this cryptic key:
1 = ADGJM 3 = BEKLO 5 = CFNPQ 7 = HIRST
2 = EFTUV 4 = HSWXY 6 = IYZ 8 = Z

- Input: Prompt the user to enter a single letter, ready for decoding.
- Echo-printing: Repeat the entered letter to confirm its reception.
- Code Translation:
    - For valid letters (A-Z), reveal the corresponding digit according to the code. If the letter is found in multiple sets, choose the biggest digit. E..g the letter H can be decoded as 4 and 7, then choose 7.
    - If the user enters an invalid character or lowercase letter, indicate that no matching digit exists.
- Constraints: you cannot dictionaries but you can use lists in your program.

Sample program executions:

```
Prompt: Enter a letter to decipher:
User input: H
Program output: You entered: H
The corresponding digit is 7.

Prompt: Enter a letter to decipher:
User input: z
Program output: You entered: z
The corresponding digit is 8.

Prompt: Enter a letter to decipher:
User input: 5
Program output: You entered: 5
No matching digit exists for this character.
```

Question 2:

Write a Python program that checks whether a given five-character string is a palindrome? If the string is not a palindrome, the program should identify the one character that needs to be replaced to make it one. For example, if the input string is ‘ABBAA’, the program should output ‘AABAA’ as the corrected palindrome. Not the slicing syntax and reversed() cannot be used in your program.

Here are some samples of program execution:

```
Enter a five-character string: abbaaa
Error: Invalid input: Please enter a five-character string.
Enter a five-character string: abbaa
abbaa is not a palindrome. Replace character 2 with 'a' to make it become a palindrome.
Revised string with uppercase: AABAA

Enter a five-character string: abcda
abcda is not a palindrome. Replace character 2 with 'd' to make it become a palindrome.
Revised string with uppercase: ADCDA
```

```
Enter a five-character string: abcde
abcde is not a palindrome. No single character replacement can make it one.
```

Question 3:

Create a Python program that simulates the roll of a six-sided die, guided by the user's choices. Here's how it should work:

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- Menu: Present a menu with options like "Roll Dice," "View Total Rolls," "View Roll Statistics," and "Exit."
- Roll Dice: When the user selects "Roll Dice," generate a random number between 1 and 6, representing the die's roll. Display the result to the user.
- Track Rolls: Keep a count of the total number of rolls made throughout the program's execution.
- View Total Rolls: When the user chooses this option, display the total number of times the die has been rolled.
- View Roll Statistics: Provide a more comprehensive breakdown of the results, showing:
    - How many times each number (1 through 6) has been rolled.
    - The percentage of times each number has appeared.
- Choose a specific number (e.g., 6) as the trigger in your code. If the die lands on the trigger number, it explodes and rolls again immediately,
- Exit: Allow the user to gracefully exit the program when they're done rolling.

```
Menu:
1. Roll Dice
2. View Total Rolls
3. View Roll Statistics
4. Exit

Enter your choice: 1
You rolled a 3!

Enter your choice: 1
You rolled a 4!

Enter your choice: 1
You rolled a 6!  The die explodes!
(Rolling again for explosion...)
You rolled a 4!

Enter your choice: 1
You rolled a 6!  The die explodes!
(Rolling again for explosion...)
You rolled a 2!

Enter your choice: 1
You rolled a 3!

Enter your choice: 2
Total rolls made: 7
```

```
Enter your choice: 3
Roll statistics:
Number 1: Rolled 0 times (0%)
Number 2: Rolled 1 times (14.29%)
Number 3: Rolled 3 times (42.86%)
Number 4: Rolled 1 times (14.29%)
Number 5: Rolled 0 times (0%)
Number 6: Rolled 2 times (28.58%) with 2 explosions!

Enter your choice: 4
Thanks for playing!
```